date the pressure was also low over the Bay of Biscay. By the 25th these storms had apparently united west of Ireland, where the pressure continued low, ranging from 29.40 (747) to 29.60 (752), until the close of the month. On the 25th a storm (low area VII, which had advanced from the north Pacific coast) was central south of Nova Scotia, where it remained nearly stationary, with pressure ranging from 29.30 (744) to 29.60 (752), until the close of the month.

OCEAN ICE IN JUNE.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for June during the last nine years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
	° ′	° ′		° ′	° ′
June, 1883	40 28	51 45	June, 1883	48 14	42 43
June, 1884	40 42	47 49	June, 1884	44 00	45 23
June, 1885	39 38	48 12	June, 1885	45 14	41 12
June, 1886	40 30	53 00	June, 1886	49 15	40 00
June, 1887	40 40	48 34	June, 1887	43 22	39 19
June, 1888	43 38	43 24	June, 1888	43 38	43 24
June, 1889	42 54	49 54	June, 1889	46 57	40 29
June, 1890	40 01	52 00	June, 1890*	46 08	37 07
June, 1891	40 15	50 24	June, 1891	44 15	43 47
Mean	40 58	49 27	Mean	45 41	41 29

*On the 10th a small block of ice was reported in N. 46° 28′, W. 28° 34′.

The above table shows that for June, 1891, ice was reported about three-fourths degree north and more than two degrees west of the average southern and eastern limits of ice for the corresponding month of the last eight years. The southernmost ice reported was an iceberg on the 14th, and the easternmost ice was an iceberg on the 21st, in the positions given. Immense fields of ice and numerous icebergs are commonly encountered over and near the Grand Banks in June, and in the current month the aggregate quantity about equaled the average for June of preceding years. The German S. S. "Cremon" is reported as having made the passage through the Straits of Belle Isle, no date given. This was the first passage through the Straits of Belle Isle this season. No field ice was seen, but there were a number of icebergs at the entrance of the Straits, and some on the Labrador coast, but none on the Newfoundland side. On the 15th the passage of the Arctic S. S. "Kite" was blocked by pack ice at Green Island, Straits of Belle Isle. The limits of the region in which icebergs and field ice were reported for June, 1891, are shown on Chart I by ruled shading.

FOG IN JUNE.

June is one of the months of greatest fog frequency near the Banks of Newfoundland.

The limits of fog-belts west of the 40th meridian in June, 1891, as determined from reports of shipmasters, are shown on Chart I by dotted shading. Near the Banks of Newfoundland fog was reported on 12 dates; between the 55th and 65th meridians on 9 dates; and west of the 65th meridian on 4 dates. Compared with the corresponding month of the last 3 years the dates of occurrence of fog near the Grand Banks numbered 7 less than the average; between the 55th and 65th meridians 6 less than the average; and west of the 65th meridian 10 less than the average. The fog noted by shipmasters and that reported by Signal Service observers on the New England and middle Atlantic coasts generally occurred with the advance from the westward of general storms.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

Many of the voluntary stations do not have standard thermometers or shelters.

The distribution of mean temperature over the United States and Canada for June, 1891, is exhibited on Chart II by dotted isotherms. In the table of Signal Service data the monthly mean temperature and the departure from the normal are given for regular stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the average for the respective districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Signal Service represents the mean of the maximum and minimum temperatures.

The mean temperature was highest in the lower Rio Grande valley, where it was above 85, and the mean readings were above 80 in Florida, except on the east coast, over the south part of the Gulf States, and in adjoining parts of west Arizona and southeast California. The mean temperature was lowest at elevated stations in central Colorado, where it was below 45, and the mean values were below 55 in Nova Scotia, along the west coast of the Gulf of Saint Lawrence, in the lower Saint Lawrence valley, northeast Minnesota, at stations in the British Possessions north of Montana, in extreme northwest Washington, and from west Montana southward over northeast Nevada.

The mean temperature was above the normal east of the Mississippi River, except in New England, central Virginia, south Florida, and along the southwest coast of Lake Michigan. It was also above the normal in the west Gulf states, except at Galveston, Tex. In districts lying west of the Mississippi River and the west Gulf states the mean temperature was below the normal, except at San Francisco, Cal. The greatest departure above the normal temperature occurred within an area extending from the east Gulf states over west Michigan, where it was more than 2, and the most marked departure below the normal temperature was noted within an area extending from the upper Missouri valley over the middle plateau region, where it was more than 4.

From the 15th to 17th unusually warm weather for the season prevailed over New England and the middle Atlantic states, the temperature ranging 10 to 20 above the normal. In New England and New York the temperature was higher than previously reported during the second decade of June. On the 16th the maximum temperature was the highest ever reported for June at the following-named stations: Portland, Me., 94, 4 above; Boston, Mass., 96, 3 above; Northfield, Vt., 90, 5 above; Albany, N. Y., 96, 6 above; New York City, 94, 3 above; Philadelphia, Pa., 94, the same.

The seasonal temperature, January to June, inclusive, averaged about as follows: in the south Atlantic and east Gulf states, the Rio Grande and Missouri valleys, and along the north and south Pacific coasts the temperature was about normal; in the extreme northwest it was about 3 in excess; in New England and the Lake region about 2 in excess; and in the middle Atlantic states, the Ohio Valley and Tennessee, the upper Mississippi valley, and over the northern plateau region about 1 in excess. Over the southern and middle plateau regions the mean temperature for this period was about 3 deficient; at Key West, Fla., and on the northeast and middle-eastern slopes of the Rocky Mountains about 2 deficient; and in the west Gulf states, on the southeast slope of the Rocky Mountains, and along the middle Pacific coast about 1 deficient.

At the following-named stations the mean temperature for the current month was the highest ever reported for June: Grand Coteau, La., 82, 2.5 above the normal, and 0.3 above 1885; Palestine, Tex., 79.9, 1.4 above the normal, and 0.4 above 1883; Rio Grande City, Tex., 86.8, 2.0 above the normal, and

0.2 above 1881. The highest mean temperature ever reported for June occurred over a greater part of the Ohio Valley and the upper Lake region and in the south Atlantic states in 1890, when the mean was 3 to 5 above the normal; over a greater part of the northern plateau and on the north Pacific coast in 1889, when the mean temperature was 3 to 5 above the normal; on the south Pacific coast in 1883, when the mean temperature was 1 to 2 above the normal; in the Gulf States and thence northwestward over the middle-eastern slope of the Rocky Mountains in 1881, when the mean temperature was 2 to 5 above the normal; in New York and Pennsylvania in 1876, when the mean temperature was 3 to 6 above the normal; and from Kentucky and south Indiana eastward to the Atlantic coast in 1874, when the mean temperature was 3 to 8 above the normal.

Over a great part of the Rocky Mountain and plateau regions, in the upper Missouri valley, and thence to Lake Superior the mean temperature for the current month was the lowest ever reported for June. At Duluth, Minn., the mean temperature, 53.8, was 4.0 below the normal, and the same as 1888; Huron, S. Dak., 64.1, 2.2 below the normal, and 0.6 below 2 or more years; Fort Assinniboine, Mont., 58.0, 4.3 below the normal, and 1.2 below 1888; Fort Custer, Mont., 60.8, 3.8 below the normal, and 1.5 below 1885; Fort Shaw, Mont., 57.0, 5.6 below the normal, and 1.1 below 1877; Fort Buford, N. Dak., 57.6, 6.9 below the normal, and 3.5 below 1880; Fort Yates, N. Dak., 63.4, 7.4 below the normal, and 2.7 below 1888; North Platte, Nebr., 64.3, 4.3 below the normal, and 1.2 below 1885; Valentine, Nebr., 63.7, 3.3 below the normal, and 1.4 below 1886; Dodge City, Kans., 69.6, 3.0 below the normal, and 0.2 below 1889; Fort Bowie, Ariz., 75.5, 2.1 below the normal, the same as 1885; Winnemucca., Nev., 58.0, 5.0 below the normal, and 1.8 below 1885; Salt Lake City, Utah, 62.0, 6.1 below the normal, and 1.0 below 1885; Albany, Oregon, 59.0, 2.9 below the normal, and 1.0 below 1880; Fort Townsend, Wash., 56.0, 2.9 below the normal, the same as 1879; Neah Bay, Wash., 55.4, 0.2 below 1884. The lowest mean temperature ever reported for June occurred from Michigan and Wisconsin southward to Louisiana and Texas in 1889, when the mean temperature was 3 to 4 below the normal; in the Sacramento Valley and the south Atlantic states in 1884, when the mean temperature was 3 to 4 below the normal in the Sacramento Valley and 3 to 5 below in the south Atlantic states; and from the lower lake region to the New Jersey and south New England coasts in 1881, when the mean temperature was 2 to 5 below the normal.

In 1889, when the mean temperature was the highest ever reported for that month over the northern plateau region and on the north Pacific coast, it was the lowest ever noted for June from the upper lake region to the west Gulf states; and in 1881, when it was the highest ever reported for June from the middle-eastern slope of the Rocky Mountains southeastward over the Gulf States, it was the lowest ever noted for that month from the lower lake region to the New Jersey and south New England coasts.

RANGES OF TEMPERATURE.

The greatest and least daily ranges of temperature are given in the table of Signal Service data. The greatest monthly ranges of temperature occurred over the west part of the middle and southern plateau regions, in central California to the coast line, and from the Dakotas eastward to the New England coast, where they exceeded 50, and at stations in those regions the monthly ranges exceeded 60. The least monthly ranges occurred along the immediate Pacific coast north of the 40th parallel, at San Diego, Cal., and along the immediate Gulf and south Atlantic coasts, where they were less than 30, and at Key West, Fla., the monthly range was 16.

DEVIATIONS FROM NORMAL TEMPERATURE.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for June for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for June, 1891; (4) the departure of the current month from the normal; (5) and the extreme monthly mean for June, during the period of observation and the years of occurrence:

State and station.	County.	(1) Normal for the month of June.	(2) Length of record.	(3) Mean for June, 1891.	(4) Departure from normal.	(5) Extreme monthly mean for June.			
						Highest.	Year.	Lowest.	Year.
Arkansas.		°	Years	°	°	°		°	
Lead Hill	Boone	77.0	9	77.6	+ 0.6	80.2	1885	74.9	1889
California.									
Sacramento	Sacramento	70.0	38	65.7	— 4.3	77.0	1853	64.4	1890
Connecticut.									
Middletown	Middlesex	66.5	24	66.0	— 0.5	72.6	1876	62.9	1863
Florida.									
Merritt's Island	Brevard	79.4	9	75.5	— 3.9	83.4	1890	75.4	1889
Georgia.									
Forsyth	Monroe	76.6	17	81.0	+ 4.4	81.9	1880, '81	74.2	1884
Illinois.									
Peoria	Peoria	73.9	35	73.6	— 0.3	79.7	1873	69.4	1869
Riley	McHenry	66.8	35	66.4	— 0.4	73.9	1856	62.1	1862
Indiana.									
Vevay	Switzerland	73.5	25	74.6	+ 1.1	77.9	1867	68.4	1869
Iowa.									
Cresco	Howard	66.1	18	65.4	— 0.7	72.0	1873	62.8	1877
Monticello	Jones	65.6	37	69.8	+ 4.2	74.0	1856	64.1	1863
Logan	Harrison	70.1	17	70.2	+ 0.1	74.4	1887	64.5	1876
Kansas.									
Lawrence	Douglas	73.7	22	70.7	— 3.0	77.2	1881	69.8	1879
Wellington	Sumner	73.9	12	74.1	+ 0.2	81.4	1890	65.8	1889
Louisiana.									
Grand Coteau	Saint Landry	79.5	8	82.0	+ 2.5	82.0	1891	78.2	1887
Maine.									
Orono	Penobscot	62.0	21	62.5	+ 0.5	64.8	1884, '89	57.5	1881
Maryland.									
Cumberland	Allegany	68.6	31	70.1	+ 1.5	74.0	1874	63.5	1863
Massachusetts.									
Amherst	Hampshire	66.6	55	65.2	— 1.4	70.6	1876	59.0	1863
Newburyport	Essex	65.0	13	64.3	— 0.7	68.2	1883	59.4	1881
Somerset	Bristol	68.7	19	68.6	— 0.1	72.2	1876	64.3	1881
Michigan.									
Kalamazoo	Kalamazoo	67.0	14	69.8	+ 2.8	70.0	1887	63.7	1889
Thornville	Lapeer	67.7	14	68.6	+ 0.9	71.7	1890	64.1	1881
Minnesota.									
Minneapolis	Hennepin	66.7	26	65.2	— 1.5	72.0	1873	61.9	1877
Montana.									
Fort Shaw	Lewis & Clarke	62.6	22	57.0	— 5.6	70.6	1871	57.0	1891
New Hampshire.									
Hanover	Grafton	64.0	57	63.5	— 0.5	69.8	1870	57.9	1839
New Jersey.									
Moorestown	Burlington	70.3	28	70.9	+ 0.6	73.8	1865	66.3	1886
South Orange	Essex	69.0	19	68.4	— 0.6	73.6	1876	63.4	1881
New York.									
Cooperstown	Otsego	64.0	37	63.6	— 0.4	71.9	1870	57.3	1863
Palermo	Oswego	64.6	37	64.8	+ 0.2	71.6	1870	59.4	1855
North Carolina.									
Lenoir	Caldwell	70.2	19	73.2	+ 3.0	75.0	1874	63.6	1887
Ohio.									
N'th Lewisburgh	Champaign	69.0	59	72.3	+ 3.3	77.5	1890	61.0	1879
Wauseon	Fulton	68.4	21	69.0	+ 0.6	72.8	1890	64.8	1889
Oregon.									
Albany	Linn	61.9	12	59.0	— 2.9	66.1	1889	59.0	1891
Eola	Polk	59.8	21	55.8	— 4.0	65.0	1889	54.5	1873
Pennsylvania.									
Dyberry	Wayne	64.9	24	63.7	— 0.4	68.2	1870	60.4	1881
Grampian Hills	Clearfield	66.4	26	67.9	+ 1.5	70.0	1865, '90	61.3	1878
Wellsborough	Tioga	66.0	12	61.5	— 4.5	74.6	1883	61.1	1881
South Carolina.									
Statesburgh	Sumter	76.3	10	77.0	+ 0.7	80.5	1881	72.4	1884
Tennessee.									
Austin	Wilson	76.2	20	79.2	+ 3.0	85.5	1874	72.1	1878
Texas.									
New Ulm	Austin	80.2	18	81.1	+ 0.9	85.0	1881	77.4	1889
Vermont.									
Strafford	Orange	65.9	18	64.6	— 1.3	71.1	1884	58.4	1881
Virginia.									
Birdsnest	Northampt'n	74.5	23	73.6	— 0.9	77.7	1880	70.4	1887
Washington.									
Fort Townsend	Jefferson	58.9	18	56.0	— 2.9	61.7	1888	56.0	1891
Wisconsin.									
Madison	Dane	67.8	19	67.2	— 0.6	72.4	1873	62.5	1869

NORMAL TEMPERATURE FOR JUNE.

The normal distribution of temperature in the United States for June is shown by chart IV. The data used in the preparation of this chart were supplied largely by the records of observations at Signal Service stations for twenty years—1871 to 1890—and the normal values upon which the lines are based are given in the tables below. The underscored figures on the chart indicate temperatures observed at voluntary stations; the other figures show temperatures observed at Signal Service stations. An explanation of the methods employed in obtaining the temperature values is printed in the REVIEW for May, 1891.

Table of normal temperature for June—Signal Service stations.

Stations.	Length of record.	Normal.	Stations.	Length of record.	Normal.
	Years	°		Years	°
Albany, N. Y.	17	68.4	Lynchburgh, Va.	20	74.1
Atlantic City, N. J.	17	66.8	Marquette, Mich.	20	58.6
Augusta, Ga.	19	78.8	Memphis, Tenn.	20	77.8
Baltimore, Md.	20	73.3	Milwaukee, Wis.	20	62.9
Bismarck, N. Dak.	16	64.3	Mobile, Ala.	20	79.9
Boston, Mass.	20	66.0	Montgomery, Ala.	18	79.3
Buffalo, N. Y.	20	64.5	Morgantown, W. Va.	10	70.5
Buford, Fort, N. Dak.	12	64.2	Nashville, Tenn.	20	76.4
Cairo, Ill.	19	75.0	New Haven, Conn.	18	67.1
Charleston, S.C.	20	79.2	New London, Conn.	20	65.6
Cheyenne, Wyo.	20	61.2	New Orleans, La.	20	80.4
Chicago, Ill.	20	65.8	New York City	20	68.7
Cincinnati, Ohio.	20	73.7	Norfolk, Va.	20	75.0
Cleveland, Ohio.	20	67.5	North Platte, Nebr.	16	68.3
Davenport, Iowa.	19	70.4	Omaha, Nebr.	20	71.5
Denver, Colo.	19	66.7	Oswego, N. Y.	20	63.8
Detroit, Mich.	20	67.4	Philadelphia, Pa.	20	71.3
Dodge City, Kans.	16	72.8	Pittsburg, Pa.	20	69.8
Dubuque, Iowa.	17	68.9	Rochester, N. Y.	19	62.4
Duluth, Minn.	20	57.8	Roseburgh, Oregon.	13	61.5
Eastport, Me.	18	55.2	Saint Louis, Mo.	20	74.6
Erie, Pa.	18	67.0	Saint Paul, Minn.	20	67.2
Escanaba, Mich.	20	60.7	San Francisco, Cal.	20	58.6
Grand Haven, Mich.	20	64.1	Savannah, Ga.	20	79.6
Indianapolis, Ind.	20	72.4	Shreveport, La.	19	80.1
Jacksonville, Fla.	19	80.3	Toledo, Ohio.	20	69.5
Key West, Fla.	20	82.8	Vicksburg, Miss.	19	79.5
Knoxville, Tenn.	20	73.4	Washington City.	20	73.1
La Crosse, Wis.	18	68.7	Wilmington, N. C.	20	76.6
Leavenworth, Kans.	20	73.5	Yankton, S. Dak.	18	68.8
Los Angeles, Cal.	13	65.9	Yuma, Ariz.	15	85.1
Louisville, Ky.	19	74.4			

Signal Service, post hospital, voluntary, and stations of the Canadian meteorological service.

Stations.	Length of record.	Normal.	Stations.	Length of record.	Normal.
	Years	°		Years	°
Amherst, Mass.	53	52.0	McDowell, Fort, Ariz.	24	88.1
Astoria, Oregon.	25	57.0	McIntosh, Fort, Tex.	23	85.3
Atlanta, Ga.	25	75.1	Mohave, Fort, Ariz.	26	89.3
Austin, Tex.	35	81.0	Monterey, Cal.	26	59.9
Bidwell, Fort, Cal.	23	64.0	Montreal, Quebec.	56	65.0
Boise City, Idaho.	24	67.7	North Lewisburgh, Ohio.	59	68.9
Bowie, Fort, Ariz.	22	80.1	Northport, Mich.	18	62.3
Brady, Fort, Mich.	51	59.0	Olympia, Wash.	18	60.9
Bridger, Fort, Wyo.	27	58.7	Parry Sound, Ont.	15	60.7
Brooke, Fort, Fla.	31	79.7	Peoria, Ill.	35	73.3
Brownsville, Tex.	33	82.3	Portland, Me.	47	65.2
Buford, Fort, N. Dak.	24	64.5	Portland, Oreg.	23	62.7
Canton, N. Y.	27	66.4	Prescott, Ariz.	23	68.9
Chatham, N. B.	16	59.5	Promontory, Utah.	19	69.2
Clark, Fort, Tex.	18	82.3	Quebec, Quebec.	44	62.1
Colville, Fort, Wash.	18	63.5	Randall, Fort, S. Dak.	20	71.3
Cooperstown, N. Y.	34	64.0	Red Bluff, Cal.	20	75.7
Craig, Fort, N. Mex.	21	78.8	Ripley, Fort, Minn.	27	65.2
Danville, Ky.	18	74.1	Rockliffe, Ont.	14	59.8
Davis, Fort, Tex.	20	75.3	Sacramento, Cal.	38	70.0
Eagle Pass, Tex.	22	84.5	San Antonio, Tex.	24	81.1
El Paso, Tex.	28	81.5	San Diego, Cal.	34	64.4
Father Point, Quebec.	14	52.8	Santa Fe, N. Mex.	35	67.8
Fort Smith, Ark.	25	76.1	Salt Lake City, Utah.	30	67.6
Galveston, Tex.	22	82.0	Saint Vincent, Minn.	19	62.5
Gaston, Fort, Cal.	27	66.6	Saugeen, Ont.	16	59.3
Gibson, Fort, Ind. T.	46	76.5	Shaw, Fort, Mont.	22	62.4
Grampian Hills, Pa.	26	66.3	Sill, Fort, Oklahoma T.	20	77.8
Grant, Fort, Ariz.	24	79.5	Stanton, Fort, N. Mex.	16	68.1
Green Springs, Ala.	28	76.5	Sully, Fort, S. Dak.	22	69.3
Halifax, N. S.	39	57.2	Sydney, C. B. I.	21	54.8
Halleck, Fort, Nev.	22	65.6	Toronto, Ont.	51	62.6
Harrisburg, Pa.	32	73.8	Totten, Fort, N. Dak.	21	63.6
Howard, Fort, Wis.	22	66.2	Truckee, Cal.	20	58.0
Humboldt, Nev.	20	71.8	Union, Fort, N. Mex.	37	66.5
Indianola, Tex.	15	81.9	Washington, Ark.	22	75.1
Kingston, Ont.	21	63.6	Wingate, Fort, N. Mex.	27	69.8
Klamath, Fort, Oregon.	25	55.5	Winnemucca, Nev.	21	69.0
Lansing, Mich.	27	67.7	Winnipeg, Man.	22	62.4
Lapwai, Fort, Idaho.	17	68.0	Wytheville, Va.	25	67.8
Lenoir, N. C.	19	71.2	Yarmouth, N. S.	14	55.0
Lunenburgh, Vt.	40	64.1	Yuma, Fort, Ariz.	25	89.1
Marietta, Ohio.	57	69.6			

MAXIMUM AND MINIMUM TEMPERATURES.

The highest temperature reported by a regular station of the Signal Service was 116, at Yuma, Ariz. The temperature was 110 or above in adjoining parts of west Arizona and southeast California, and in the Sacramento and San Joaquin valleys, and was above 100 in the middle and lower Rio Grande valleys, central Texas, and over parts of central and southeast California. At the following-named stations the maximum temperature was as high or higher than previously reported for June: Jacksonville, Fla., 100, the same as 1880; Palestine, Tex., 96, 2 above 1890; Yuma, Ariz., 116, the same as 1883; San Francisco, Cal., 100, 5 above 1883; Sacramento, Cal., 106, 4 above 1883; Red Bluff, Cal., 110, 5 above 1883; Eureka, Cal., 73, 2 above 1888. The lowest maximum temperature reported was 65, at Tatoosh Island, Wash.; the maximum temperature was below 70 along the Washington coast, and was below 80 along the Pacific coast north of the 40th parallel, at San Diego, Cal., and at stations on the southeast and extreme east New England coasts. The reports of United States Army post surgeons and voluntary observers show maximum temperature above 100 in the middle, south Atlantic, and Gulf states, the Ohio Valley and Tennessee, Wisconsin, Kansas, Wyoming, Utah, New Mexico, Arizona, and California, the highest, 121, being noted at Fort Mohave, Ariz.

The lowest temperature reported by regular stations of the Signal Service was 30 at Northfield, Vt., and Winnemucca, Nev.; the temperature fell to 31 at Marquette, Mich., and to 32 at Saint Vincent, Minn., and Fort Du Chesne, Utah, and was below 40 north of a line traced from the middle New England coast north of west to south North Dakota, thence southwest to northeast Colorado, thence southward to central New Mexico, thence over central Arizona, thence to northwest Utah, thence to east California in about latitude 38°, thence to west Oregon, thence eastward, describing a loop over the Columbia Valley, and thence to northwest Washington. The highest minimum temperature was noted over extreme southern Florida, extreme south Louisiana, and in the lower Rio Grande valley, where it was 70 or above. At the following named stations of the Signal Service the minimum temperature was as low or lower than previously reported for June: Portland, Me., 42, the same as 1875; Woods Holl, Mass., 45, 1 below 1876; Nantucket, Mass., 43, 3 below 1884; Block Island, R. I., 46, the same as 1884; Baltimore, Md., 47, 2 below 1873; Washington City, 45, 1 below 1873; Buffalo, N. Y., 39, 1 below 1879; Alpena, Mich., 34, the same as 1881; Marquette, Mich., 31, the same as 1881; Fort Bowie, Ariz., 50, 1 below 1885; Fort Grant, Ariz., 49, the same as 1885; San Carlos, Ariz., 42, 1 below 1883; Yuma, Ariz., 52, 4 below 1878; San Francisco, Cal., 48, the same as 2 or more years; Roseburgh, Oregon, 38, the same as 1880; Astoria, Oregon, 42, 1 below 1885; and Spokane Falls, Wash., 34, 4 below 1887. The reports of United States Army post surgeons and voluntary observers show minimum temperature below 32 in north New England, northeast New York, central Pennsylvania, the upper parts of Michigan, Wisconsin, and Minnesota, southwest South Dakota, and at stations in the plateau region from central Arizona to Washington, the lowest temperature reported, 3, being noted at Breckenridge, Colo.

FROST.

The following is a summary of reports of frost injurious to vegetation made by regular and voluntary observers: On the 5th frost damaged tender vegetation in Maine, Vermont, north-central, northeast, and southwest New York, southeast Michigan, and northeast Wisconsin. On the 6th plants were killed on low ground in Wayne Co., Pa. On the 8th small fruits were injured in Florence Co., Wis., and killing frost was reported at Spokane Falls, Wash. On the 9th fruit and vegetables were reported killed at Winnemucca, Nev. On the 23d tender vegetables were injured at American Falls, Oneida Co., Idaho, and gardens were badly damaged at Beulah and Jordan Valley, Oregon. On the 28th vegetation was reported damaged at Corry, Erie Co., Pa.

The frost of the 5th from Maine to Wisconsin, of the 6th in Pennsylvania, and of the 8th in Wisconsin was about one month late, when compared with the date of last killing frost in the respective districts; the last killing frost in the regions referred to generally occurs during the early part of May.

During the current month frost occurred in New England and New York on the 5th and 6th; at elevated stations in Pennsylvania on the 5th, 6th, 8th, 9th, and 27th to 29th; in Michigan

from the 3d to 8th, and 11th; in Wisconsin on the 5th and 7th. In the plateau region frost occurred as far south as central Arizona on the 2d and 15th; at Winnemucca, Nev., on the 9th, 20th, and 26th; in extreme north-central California on the 1st, 7th, 9th, 18th, 20th, and 23d; and at Port Angeles, Washington, on the 7th and 8th.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for June, 1891, as determined from the reports of nearly 2,000 stations, is exhibited on Chart III. In the table of Signal Service data the total precipitation and the departure from the normal are given for each Signal Service station. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

The distribution of precipitation in the central valleys was irregular, very heavy rainfall occurring in small areas in the states of the middle and lower Missouri valleys.

The monthly precipitation exceeded 10.00 on the east-central coast of Florida, in northwest Iowa, east Kansas, east Nebraska, central Missouri, central Oklahoma Territory, east-central Ohio, and south Mississippi. At California, Mo., a depth of 23.90 was reported, and at Larrabee, Iowa, 19.88 fell.

Over a great part of south California and west Arizona no rainfall was reported, and the monthly precipitation was generally less than 1.00 in California south of the 40th parallel, over the southern plateau region, along the Rio Grande River, at stations along the north coast of the upper lakes, and in the lower Saint Lawrence valley.

The monthly precipitation was generally in excess of the average west of the Mississippi River and north of the 35th parallel, and in an area extending from the upper Ohio valley and south Pennsylvania to Alabama and Mississippi. Precipitation was also in excess of the average in Nova Scotia, and at Boston, Mass. The greatest departure above the normal precipitation occurred in central Tennessee, from central Kansas northward over east South Dakota, over a part of the northeastern slope of the Rocky Mountains, and on the north Pacific coast, where it was more than 2.00, and the most marked departure below the normal precipitation occurred on the south Atlantic coast, where it was more than 4.00, and the deficiency was more than 2.00 in the lower Ohio valley, Louisiana, the lower Saint Lawrence valley, and at Duluth, Minn., Escanaba, Mich., Dubuque, Iowa, Erie, Pa., and New York City.

Considered by districts, the average percentage of the normal in districts where the precipitation was in excess was about as follows: Northern plateau, 210 per cent.; northeast slope of the Rocky Mountains, 170 per cent.; extreme northwest, 166 per cent.; north Pacific coast, 160 per cent.; Missouri Valley and middle-eastern slope of the Rocky Mountains, 140 per cent.; middle plateau, 130 per cent.; southeast slope of the Rocky Mountains, 104 per cent.; Ohio Valley, 103 per cent. In districts where the precipitation was deficient the percentage was about as follows: south Pacific coast, 20 per cent.; southern plateau, 50 per cent.; south Atlantic states and upper lake region, 60 per cent.; middle Atlantic and west Gulf states, lower lake region, middle Pacific coast, and at Key West, Fla., 70 per cent.; New England and the upper Mississippi valley, 80 per cent.; east Gulf states, 90 per cent.

At the following-named stations the precipitation for the current month was the heaviest ever reported for June: Cumberland, Md., 7.67, 4.30 greater than the normal, and 1.83 greater than in 1880; Saint Vincent, Minn., 8.17, 4.79 greater than the normal, and 0.80 greater than in 1888; Huron, S. Dak., 8.08, 4.45 greater than the normal, and 2.21 greater than in 1890; Fort Buford, N. Dak., 7.08, 3.80 greater than normal, and 0.32 greater than in 1888; Fort Custer, Mont., 5.06, 2.44 greater than the normal, and 0.15 greater than in 1888; Fort Shaw, Mont., 6.50, 4.64 greater than the normal, and 1.52 greater than in 1879; Walla Walla, Wash., 3.61, 2.24 greater than the normal, and 1.24 greater than in 1888; Tatoosh Island, Wash., 7.44, 4.25 greater than the normal, and 0.30 greater than in 1888. The greatest precipitation for June occurred in north Louisiana and in east-central Texas in 1889, when the precipitation was 3.00 to 6.00 in excess; along the Pacific coast north of the 40th parallel in 1888, when the excess was 2.00 to 4.00; along the middle and south Pacific coasts in 1884, when the excess was 0.25 to 2.25; in the lower Missouri valley in 1883, when the excess was 5.00 to 6.00; in southeast New England in 1881, when the excess was 3.00 to 5.00; and on the south Atlantic coast in 1876, when the excess was 6.00 to 11.00.

At the following-named stations the precipitation for the current month was the least ever reported for June: New York City, 1.18, 2.23 deficient, and 0.11 less than in 1873; Charleston, S. C., 1.20, 4.08 deficient, and 0.12 less than in 1890; Erie, Pa., 1.22, 2.94 deficient, and 0.97 less than in 1873; and Springfield, Ill., 2.11, 3.30 deficient, and 0.36 less than in 1880. The least precipitation reported for June occurred from east Washington over Montana and the Red River of the North Valley in 1889, when the deficiency was 2.00 to 3.00; along the west Gulf coast in 1881, when the deficiency was 2.00 to 5.00. In 1889, when the precipitation was the heaviest reported for June in north Louisiana and east-central Texas, it was the least reported for that month over the north-central part of the country, and in 1881, when it was greatest over southeast New England, it was the least noted for June on the west Gulf coast.

The precipitation, January to June, 1891, averaged about normal in New England, the middle Atlantic states, the Ohio Valley and Tennessee, on the southeast slope of the Rocky Mountains, and along the Pacific coast. In the extreme northwest, on the northeast and middle-eastern slopes of the Rocky Mountains, and over the southern plateau region it was one-fourth to one-half greater than usual, and in the Missouri Valley and over the plateau region it was about one-tenth greater than usual. At Key West, Fla., the rainfall for the period named averaged about six-tenths, and in the south Atlantic and Gulf states, the Lake region, and the upper Mississippi valley about eight to nine tenths of the average amount.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for June for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for June, 1891; (4) the departure of the current month from the average; (5) and the extremes for June during the period of observation and the years of occurrence:

State and station.	County.	(1) Average for the month of June.	(2) Length of record.	(3) Total for June, 1891.	(4) Departure from average.	(5) Extremes for June.			
						Greatest.		Least.	
						Am't.	Year.	Am't.	Year.
Arkansas.		*Inches*	*Years*	*Inches*	*Inches.*	*Inches.*		*Inches*	
Lead Hill	Boone	4.65	9	6.62	+1.97	7.14	1882	2.18	1890
California.									
Sacramento	Sacramento	0.13	41	0.08	−0.05	1.57	1884	0.00	*
Connecticut.									
Middletown	Middlesex	4.58	29	2.70	−1.88	8.05	1862	0.49	1873